

1. Record Nr.	UNINA9910132304903321
Titolo	Attosecond nanophysics : from basic science to applications / / edited by Peter Hommelhoff, Matthias F. Kling
Pubbl/distr/stampa	Weinheim, Germany : , : Wiley-VCH, , [2015] ©2015
ISBN	3-527-66562-5 3-527-66564-1
Descrizione fisica	1 online resource (845 p.)
Disciplina	621.381
Soggetti	Microphysics Nanoscience
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Related Titles; Title Page; Copyright; List of Contributors; Preface; Chapter 1: Introduction; 1.1 Attosecond Tools; 1.2 Solids in Strong Fields; 1.3 Attosecond Physics in Isolated Nanosystems; 1.4 Attosecond Physics on Nanostructured Surfaces; 1.5 Perspectives; References; Chapter 2: Nano-Antennae Assisted Emission of Extreme Ultraviolet Radiation; 2.1 Introduction and Motivation; 2.2 Experimental Idea; 2.3 High-Order Harmonic Generation; 2.4 Plasmonics in Intense Laser Fields; 2.5 Experiments; 2.6 Conclusion and Outlook; References Chapter 3: Ultrafast, Strong-Field Plasmonic Phenomena3.1 Introduction; 3.2 Ultrafast Photoemission and Electron Acceleration in Surface Plasmon Fields; 3.3 Research on Surface Plasmon-Enhanced Photoemission and Electron Acceleration; 3.4 Conclusions; Acknowledgments; References; Chapter 4: Ultrafast Dynamics in Extended Systems; 4.1 Introduction-Why Ultrafast Electron Dynamics in Extended Systems?; 4.2 Multi-Photon Absorption in Extended Systems; 4.3 Coulomb Complexes: A Simple Approach to Ultrafast Electron Dynamics in FEL-Irradiated Extended Systems 4.4 Nano-Plasma Transients on the Femtosecond Scale4.5 Summary; 4.6 Acknowledgments; References; Chapter 5: Light Wave Driven Electron Dynamics in Clusters; 5.1 Introduction; 5.2 Resolving Light-Matter Interactions on the Atomic-Scale; 5.3 Fundamentals of the

Microscopic Particle-in-Cell Approach; 5.4 Microscopic Analysis of Laser-Driven Nanoclusters; 5.5 Conclusions; References; Chapter 6: From Attosecond Control of Electrons at Nano-Objects to Laser-Driven Electron Accelerators; 6.1 Attosecond Control of Electrons at Nanoscale Metal Tips; 6.2 Experiments on Dielectric Nanospheres 6.3 The Influence of the Spatial Field Distribution on Photoelectron Spectra 6.4 Time Resolved Pump-Probe Schemes; 6.5 Electron Acceleration with Laser Light at Dielectric Nano-Gratings; References; Chapter 7: Theory of Solids in Strong Ultrashort Laser Fields; 7.1 Interaction of Ultrafast Laser Pulse with Solids: Coherent and Incoherent Electron Dynamics; 7.2 One Dimensional Tight Binding Model; 7.3 3D Model of Electron Dynamics; References; Chapter 8: Controlling and Tracking Electric Currents with Light; 8.1 Introduction 8.2 Electric Field Control of Currents: From the Vacuum Tube to the Transistor 8.3 Generating Electric Currents with Light: An Ultrabroad-Bandwidth Control Tool; 8.4 Optical Field Control of Electric Current in Large Bandgap Materials; 8.5 Attosecond Probing of the Strong-Field-Induced Changes of the Dielectric Electronic Properties; 8.6 Detection of the Carrier-Envelope Phase Using Optical-Field-Induced Currents; 8.7 Toward Ultrafast Photoactive Logic Circuits?; References; Chapter 9: Ultrafast Nano-Focusing for Imaging and Spectroscopy with Electrons and Light; 9.1 Introduction 9.2 Adiabatic Nanofocusing

Sommario/riassunto

The first broad and in-depth overview of current research in attosecond nanophysics, covering the field of active plasmonics via attosecond science in metals and dielectrics to novel imaging techniques with the highest spatial and temporal resolution. The authors are pioneers in the field and present here new developments and potential novel applications for ultra-fast data communication and processing, discussing the investigation of the natural timescale of electron dynamics in nanoscale solid state systems. Both an introduction for starting graduate students, as well as a look at the current
